Advanced High-Speed Network for Remote Access Image Processing, and Delivery

Introduction

The U.S. Department of the Interior, U.S. Geological Survey (USGS) and Sprint Corporation have entered into a cooperative research and development agreement (CRADA) to explore the use of advanced, high-speed wide area networks for delivering several innovative networking applications. The CRADA will help the USGS develop a prototype for the remote archiving, access, and delivery of large (1+ gigabyte) image data sets.

Capabilities

This CRADA is a three-phase, 3-year effort and will include hardware and software for the project and an asynchronous transfer mode (ATM) network link. Phase 1 will install network hardware and ATM connections and provide maintenance for the system. Phase 1 also will (1) develop a sample image data set from advanced very high resolution radiometer, aerial photographs, global normalized difference vegetation index, and Landsat thematic mapper data; (2) develop an interactive roam and information synthesis software for remote interaction with image data; and (3) demonstrate applications developed during this phase. Phase 2 will develop query and browse user interfaces and an information management system so data can be selected from an archive, evaluated for user suitability, and staged for remote interaction and delivery. Phase 3 will develop software designed to perform online registration, warping, resampling, and other user-driven image processing as an integral part of the data transfer process. Each phase will include quarterly reports on new techniques developed, an annual statement of progress, and delivery of complete documentation including source code and reference guides for all software systems developed.

The USGS EROS Data Center (EDC) will provide the primary facilities, sample image data sets, and technical staff to perform the programming and subsequent data manipulation for this project. Sprint will provide the installation and maintenance of network hardware and ATM connections.

Advantages

The USGS believes that cooperative research in wide area networks offering an effective communication speed on the order of 1 gigabit per second is in the public good and will greatly enhance the USGS's ability to provide accurate and timely scientific and technical information. Advances in digital imaging technologies now provide the capability to collect digital images with increased frequency and improved spectral and spatial resolution. The development of high-speed wide area networks for remote access, image processing, and delivery of large data sets to a rapidly expanding customer base is therefore crucial to meeting the future needs of the user community. The USGS further believes that this CRADA is only part of the development of high-speed, remote interaction networks and that other opportunities for collaboration will emerge. It is hoped that results from this research will demonstrate the need for high-performance computers that can connect to high-speed networks and concurrently support applied research that will help define requirements for the advanced communication features of a global grid.

For More Information

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